

CLAIMS:

1 1. An information processing system comprising:
2 first and second levels of a storage hierarchy, wherein accessing information
3 in the first level consumes more energy than accessing information in the second level;

4 and

5 a processor for writing information to the second level of storage based on
6 energy-conserving criteria.

1 2. The system of claim 1 wherein the energy-conserving criteria comprise a
2 collection of heuristics.

1 3. The system of claim 1 wherein the energy-conserving criteria comprise system
2 state information.

1 4. The system of claim 3 wherein the system comprises a storage input/output
2 subsystem and system state information comprises whether the storage input/output
3 subsystem is using one or more specific files.

1 5. The system of claim 3 wherein the system state information comprises at least
2 one factor from among the following factors:

3 the storage input/output associated with one or more predetermined software
4 applications;

5 a sequence of storage input/output operations;

6 observed interactions with the first level of the storage hierarchy and wherein
7 the collection of heuristics infer the state of the second level of the storage hierarchy;
8 and

9 a type of energy source powering the system.

1 6. The system of claim 1 further comprising a power source for the system and
2 wherein the system state information comprises information identifying the amount of
3 energy left in the power source when the system is disconnected from other sources of
4 energy.

1 7. The system of claim 3 wherein the system stores current user profiles and the
2 system state information comprises whether storage input/output data are associated
3 with a current user profile.

1 8. The system of claim 3 wherein the system stores current user preferences and
2 the system state information comprises whether storage input/output data are
3 associated with current user preferences.

1 9. The system of claim 3 wherein the system state information comprises at least
2 one factor from among the following factors:

3 the storage input/output data associated with the characteristics of the

4 connection between the first and second levels of the storage hierarchy;

5 the storage input/output data associated with characteristics of the connection

6 between the system and at least one second level of the storage hierarchy;

7 the proximity of the storage input/output to events that change the state of the

8 at least one first level of the storage hierarchy;

9 the proximity of the storage input/output to a previous interaction with at least

10 one first level of storage hierarchy;

11 an indication of a hard-disk drive spin-down event; and

12 physical characteristics of the second levels of the storage hierarchy.

1 10. The system of claim 3 wherein the system state information comprises physical
2 characteristics of the second levels of the storage hierarchy.

1 11. The system of claim 1 wherein the second levels of the storage hierarchy are
2 implemented using Flash memory.

1 12. The system of claim 3 wherein the system state information comprises the
2 number of remaining write cycles.

1 13. The system of claim 1 wherein the processor is for removing information from
2 the second level of storage based on energy-conserving criteria.

1 14. The system of claim 1 wherein writing information to the second level of storage
2 further comprises:

3 a mapping schema between cache files in the second level of storage and disk
4 files in the first level of storage, wherein each cache file is named with a logical
5 cluster number of its corresponding disk file.

1 15. The system of claim 1 comprising a hard disk drive comprising rotating
2 magnetic media comprising the first level storage and a cache comprising the
3 second level storage and an application-specific integrated circuit for managing
4 the cache according to the energy-conserving criteria.

1 15. An information handling system, comprising:
2 first and second levels of storage, wherein accessing the first level of storage
3 uses more energy than accessing the second level of storage;
4 an energy use detector for determining the level of energy being used by the
5 system; and
6 an arbiter for writing information to second level storage when the energy use
7 detector determines that the system is being powered by a battery.

1 16. An information handling system, comprising:
2 first level storage for storing information;
3 second level storage for storing information according to a set of energy-
4 saving criteria;
5 a battery level detector for determining the level of charge in a battery; and

6 a controller for writing information to the second level of storage when the
7 battery level detector determines that the battery charge is below a pre-determined
8 threshold of charge.

1 17. A method for managing storage of information in an information
2 processing system comprising two levels of storage wherein a first level is managed
3 and a second level is unmanaged wherein storing information in managed storage
4 consumes less system resources than storing information in unmanaged storage, the
5 method comprising:

6 monitoring the system to determine whether the operating state of the system
7 satisfies one or more energy-conserving criteria; and

8 storing information in managed storage when the operating state of the system
9 satisfies one or more energy-conserving criteria.

1 18. A computer readable medium comprising program instructions for:
2 monitoring a system to determine whether the operating state of the system
3 satisfies one or more energy-conserving criteria; and
4 storing information in managed storage when the operating state of the system
5 satisfies one or more energy-conserving criteria.